may be configured on the heat transfer plate **115** such that the plurality of irregularly shaped fins **515** have different heights, thicknesses, gap spaces, and/or orientations. In some implementations, the irregular arrangement of the fins **515** may be configured based on the heat map or heat generation profile of the ECP to which the heat transfer plate **115** is attached.

As further shown in FIG. **5**B, the heat transfer plate **115** includes a coated fin **520** having an irregular arrangement. For example, the irregular arrangement of fins **515** may include one or more coated fins **520**. The coating may include an evaporative surface coating, such as a copper powder that is sintered onto the surface of the fins **520**. In some implementations, the coating thickness may be a thickness between about 0.01 and about 1 mm. In some implementations, the particle size of the copper powder coating may be a particle size between about 0.01 and about 0.2 mm. The irregular arrangement of the coated fins **520** may be configured based on the heat map or heat generation profile of the ECP to which the heat transfer plate **115** is attached so that the heat transfer plate **115** includes a greater density of fins or great fin surface area directly over the regions of the ECP which generate the most heat. For example, the heat generation profile of the ECP to which the heat transfer plate **115** is coupled may include three distinct regions which generate high heat and thus require greater heat transfer to maintain proper operating conditions of the ECP components. Accordingly, the heat transfer plate **115** may be configured such that the plurality of irregular shaped fins **515** are arranged with greater fin height, thickness and/or density directly over the three highest heat producing regions. As shown in FIG. **5**B, the three ridges of each irregularly shaped fin **515** may correspond to the three highest heat producing regions of the ECP, while the two valleys of each irregularly shaped fin **515** may correspond to lower heat producing regions of the ECP. In some implementations, the coated fins **520** may include other surface enhancements to further aid heat transfer performance, such as a metal mesh or surface roughness to increase the surface area of the fin.

FIG. **6** is a diagram of an example coating configuration **600** within the evaporative region of an electronic circuit package cooling system, such as the cooling system **105** shown in FIG. **1**. As shown in FIG. **6**, the cooling system **105** includes a coating **605**. The coating **605** is included on the surfaces of each of the inner walls of the chamber forming evaporative region **120**. The coating **605** may be an evaporative surface coating, such as a copper powder that is sintered onto the inner wall surface of the chamber forming the evaporative region **120**. The coating **605** may enhance the heat transfer performance of the cooling system **105** by improving the evaporative efficiency of the heat transfer plate **115** and the inner wall surfaces of the chamber forming the evaporative region **120** to which the coating **605** is applied. The coating may include an evaporative surface coating, such as a copper powder that is sintered onto the inner surface of the walls of the chamber forming the evaporative region **120**. In some implementations, the coating thickness may be a thickness between about 0.01 and about 1 mm. In some implementations, the particle size of the copper powder coating may be a particle size between about 0.01 and about 0.2 mm. In some implementations, the inner surface of the walls of the chamber forming the evaporative region **120** may include other surface enhancements, such as a metal mesh or surface roughness to increase the surface area of the wall surfaces and further enhance the heat transfer performance of the evaporative region **120**.

FIG. **7** is also a diagram of an example coating configuration **700** within the evaporative region of an electronic circuit package cooling system **105** shown in FIG. **1**. As shown in FIG. **7**, the cooling system **105** includes a coating **705** applied to the surface of the heat transfer plate **115** and also includes a coating **710** applied to the upper portion of the chamber forming the evaporative region **120**. The coating **705** is included on the surface of the heat transfer plate **115** and covers the heat transfer plate **115** from one side of the evaporative region **120** to the other side of the evaporative region **120**. The coating **710** is included on the inner surface wall of the upper portion of the chamber forming the evaporative region **120**. The coating, **705** and/or **710**, may be an evaporative surface coating, such as a copper powder that is sintered onto the inner wall surface of the chamber forming the evaporative region **120**. The coating **705** and/or **710** may enhance the heat transfer performance of the cooling system **105** by improving the absorption of heat from the heat transfer plate **115** and improving the evaporative function of upper portion of the chamber forming the evaporative region **120**. The coating **705** and/or **710** may include an evaporative surface coating, such as a copper powder that is sintered onto the inner surface of the walls of the chamber forming the evaporative region **120**. In some implementations, the thickness of coating **705** and/or **710** may be a thickness between about 0.01 and about 1 mm. In some implementations, the coating particle size may be a particle size between about 0.01 and about 0.2 mm. In some implementations, the inner surface of the walls of the chamber forming the evaporative region **120** may include other surface enhancements, such as a metal mesh or surface roughness to increase the surface area of the wall surfaces and further enhance the heat transfer performance of the evaporative region **120**.

FIG. **8** is a diagram of an example coating configuration **800** within the condensing region of an electronic circuit package cooling system, such as the cooling system **105** shown in FIG. **1**. As shown in FIG. **8**, the cooling system **105** includes a coating **805**. The coating **805** is included on the inner surfaces of the condensing tubes **130**. The coating **805** may be a hydrophobic surface coating which functions to reduce the surface friction of the liquid coolant condensed on the inner surface of the walls of the condensing tubes **130**. By reducing the surface friction, the coating **805** may facilitate the movement of the condensed liquid coolant back into the evaporative region of the cooling system **105**. For example, the coating **805** may be a surface coating, such as a sintered copper powder. The sintered copper powder may include powder particle sizes between 0.01 mm and 0.5 mm. The sintered copper power may be sintered on the inner surface of the condensing tubes **130** to form a surface coating with a thickness between 0.01 mm and 2.0 mm. In some implementations, the condensing tubes **130** may include both a coating **805** and a plurality of grooves, such as the grooves **405** as shown in FIG. **4**. For example, the coating **805** may be applied to the inner surface of the condensing tube walls after a plurality of grooves has been formed on the inner wall surfaces of the condensing tubes **130**.

While this specification contains many specific implementation details, these should not be construed as limitations on the scope of any inventions or of what may be claimed, but rather as descriptions of features specific to particular implementations of particular inventions. Certain features that are described in this specification in the context of separate implementations can also be implemented in combination in a single implementation. Conversely, vari-